

BIOCHEMICAL AND BIOPHYSICAL

Research Communications

EDITORS:

Paul Berg

B. L. Horecker

David Bonner

W. D. McElroy

I. C. Gunsalus

Jacques Monod

Howard K. Schachman

Volume 12 • 1963



ACADEMIC PRESS

New York and London

COPYRIGHT © 1963, BY ACADEMIC PRESS INC.

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Made in the United States of America

Contents of Volume 12

Number 1, July 10, 1963

SHIGEMASA OSAKI, CHARLES WALTER, AND EARL FRIEDEN. The Ascorbate Oxidase Activity of Chelex Treated Ceruloplasmin	1
M. L. WOLFROM, J. R. VERCELLOTTI, H. TOMOMATSU, AND D. HORTON. The Linkage Sequence in Heparin	8
PER-AKE ALBERTSSON AND HERRICK BALTSCHIEFFSKY. Counter-Current Distribution of Spinach Chloroplasts in an Aqueous Two-Phase System	14
F. SOKOL, S. SCHRAMEK, AND J. SPONAR. Comparison of Different Preparations of Influenza Virus Ribonucleic Acid	21
JONATHAN D. BRODIE, GERTRUDE W. WASSON, AND JOHN W. PORTER. The Formation of Malonyl-Enzyme and Its Conversion to Fatty Acids and β -Hydroxy, β -Methyl Glutaryl Coenzyme A	27
ROBERT S. ADELSTEIN, JAMIE E. GODFREY, AND W. WAYNE KIELLEY. G-Actin: Preparation by Gel Filtration and Evidence for a Double Stranded Structure	34
EMERY M. GAL, MERRILY POCZIK, AND FINLEY D. MARSHALL, JR. Hydroxylation of Tryptophan to 5-Hydroxytryptophan by Brain Tissue <i>in Vivo</i>	39
TING-KAI LI AND BERT L. VALLEE. Selective Carboxymethylation of Functional Sulfhydryl Groups at the Active Center of Horse Liver Alcohol Dehydrogenase	44
LOUISE T. MASHBURN AND JOHN C. WRISTON, JR. Tumor Inhibitory Effect of L-Asparaginase	50
A. S. MARKOWITZ AND JON ISENBERG. Ultra-Micro Precipitin Procedure on Cellulose Acetate	56
I. W. CHEN AND F. C. CHARALAMPOUS. A Soluble Enzyme System from Yeast Which Catalyzes the Biosynthesis of Inositol from Glucose	62
NOBUO TANAKA. Mechanism of Action of O-Carbamyl-D-Serine, A New Member of Cell Wall Synthesis Inhibitors	68
FRANK EISENBERG, JR., AND ARTHUR H. BOLDEN. Biosynthesis of Inositol in Rat Testis Homogenate	72
M. R. RAGHAVENDRA RAO, S. S. SUBRAMANIAN, H. I. RAHATEKAR, AND S. V. PARANJAPE. Enzymatic Hydration of Citraconate to (—) Citramalate	78

Number 2, July 18, 1963

R. J. SUHADOLNIK AND GEORGE WEINBAUM. Effect of Structure on Nucleoside Antagonist Activity	83
ALVIN J. GLASKY AND JACOB C. HOLPER. The Appearance of Infectious Material in a Cell-Free System Obtained from Influenza Virus-Infected Calf Kidney Cells	87
ANTHONY J. ANDREOLI, MASAYUKI IKEDA, YASUTOMI NISHIZUKA, AND OSAMU HAYAISHI. Quinolinic Acid: A Precursor to Nicotinamide Adenine Dinucleotide in <i>Escherichia coli</i>	92
AGNAR P. NYGAARD AND B. D. HALL. A Method for the Detection of RNA-DNA Complexes	98
E. C. DE RENZO, W. BARG, JR., E. BOGGIANO, M. E. ENGLERT, AND M. C. DAVIES. Interaction of Streptokinase and Plasminogen	105
GABRIEL R. DRAPEAU AND ROBERT A. MACLEOD. NA^+ Dependent Active Transport of α -Aminoisobutyric Acid into Cells of a Marine Pseudomonad	111

WESLEY A. VOLK AND GILBERT ASHWELL. Enzymatic Formation of TDP-3-Acetamido-3, 6-Dideoxy Hexose	116
ROSALIA B. FRYDMAN AND ELIZABETH F. NEUFELD. Synthesis of Galactosylinositol by Extracts from Peas	121
J. J. SAUKKONEN, A. LAHTI, AND T. VAINIO. Serological Cross-Reactivity between a Ribitol Teichoic Acid and a Component of <i>Escherichia coli</i>	126
HENRY C. REEVES AND SAMUEL J. AJL. Enzymatic Formation of Lactate and Acetate from α -Hydroxyglutarate	132
HELMUT BÖHME AND ADOLF WACKER. Mutagenic Activity of Thiopyronine and Methyleneblue in Combination with Visible Light	137
E. VINUELA, MARIA L. SALAS, AND A. SOLS. End-Product Inhibition of Yeast Phosphofructokinase by ATP	140
MILDRED K. NOBLES AND C. MADHOSINGH. <i>Dactylium dendroides</i> (Bull.) Fr. Misnamed as <i>Polyporus circinatus</i> Fr.	146
H. E. SWAISGOOD AND J. R. BRUNNER. Characteristics of Kappa-Casein in the Presence of Various Dissociating Agents	148
R. D. BEVILL, J. H. NORDIN, F. SMITH, AND S. KIRKWOOD. Synthesis and Proof of Structure of Tritiated Glucose and Its Use in the Study of the Mechanism of UDPGal-C-4-Epimerase	152
E. VANDERWINKEL, P. LIARD, F. RAMOS, AND J. M. WIAME. Genetic Control of the Regulation of Isocitritase and Malate Synthase in <i>Escherichia coli</i> K12	157
ALLAN RUPPRECHT. Preparation of Oriented DNA in Large Amounts	163

Number 3, July 26, 1963

J. D. DUEKSEN AND L. W. FLEMING. Synthesis of Two Structurally Distinct β -Glucosidases by a Yeast Hybrid	169
JOHN HINDLEY. The Relative Ability of Reconstituted Nucleohistones to Allow DNA-Dependent RNA Synthesis	175
R. J. MARTINEZ. On the Chemistry of Flagella of <i>Spirillum serpens</i>	180
JOHN A. THOMA, D. E. KOSHLAND, JR., J. RUSCICA, AND ROBERT BALDWIN. The Number of Binding Sites of Sweet Potato Beta Amylase	184
HIROYOSHI NOHARA AND ALBERT S. KAPLAN. Induction of a New Enzyme in Rabbit Kidney Cells by Pseudorabies Virus	189
E. T. REESE AND A. S. PERLIN. Enzymic Preparation of 3-O- β -Cellobiosyl D-Glucose	194
WILLIAM T. NORTON AND MIRIAM BRÖTZ. New Galactolipids of Brain: A Monoalkyl-Monoacyl-Glycerol Galactoside and Cerebroside Fatty Acid Esters ..	198
EDUARDO RECONDO, MARCELO DANKERT, AND LUIS F. LELOIR. Isolation of Adenosine Diphosphate D-Glucose from Corn Grains	204
ZVI SELINGER AND MICHAEL SCHRAMM. An Insoluble Complex Formed by the Interaction of Muscle Phosphorylase with Glycogen	208
K. W. FLOYD AND RICHARD W. WHITEHEAD. The Role of Cobalamin in Methionine Synthesis of <i>E. coli</i> 113-3	215
N. SYMONDS, K. STACEY, S. W. GLOVER, J. SCHELL, AND S. SILVER. The Chemical Basis for a Case of Host-Induced Modification in Phage T2	220
GEORGE HOCH AND IRIS MARTIN. Photo-Potential of Adenosine Triphosphate Hydrolysis	223
KAZUHISA TAKETA AND BURTON M. POGELL. Reversible Inactivation and Inhibition of Liver Fructose-1, 6-Diphosphatase by Adenosine Nucleotides	229

DIETHER NEUBERT, RONALD A. CHAPLAIN, AND HELMUT COPER. Inhibition of Succinate Oxidation by DPN and DPN-Analogues in Sub-Mitochondrial Systems	236
WOLFGANG GRUBER, ROLF HÖHL, AND THEODOR WIELAND. Hydroquinone Monophosphates and Oxidative Phosphorylation	242
V. C. JOSHI, J. JAYARAMAN, AND T. RAMASARMA. On the Biosynthesis of Ubichromenol	247
NOBUHIKO KATUNUMA AND MITSUKO OKADA. Respiratory Inhibition of TCA Cycle and Control of Glutamic Acid Synthesis by Ammonia in Rat Liver Mitochondria	252

Number 4, August 1, 1963

BEVERLY PETERKOFISKY AND SIDNEY UDENFRIEND. Localization of the Site of Proline Hydroxylation during the Cell-Free Biosynthesis of Collagen.....	257
ALBERT WAKSMAN AND EUGENE ROBERTS. Transaminase Activity of Diaphorase, Phosphorylase A, and Several Dehydrogenases	263
A. PARMEGGIANI AND R. H. BOWMAN. Regulation of Phosphofructokinase Activity by Citrate in Normal and Diabetic Muscle.....	268
R. G. EAGON. Rate Limiting Effects of Pyridine Nucleotides on Carbohydrate Catabolic Pathways of Microorganisms.....	274
G. W. KIDDER AND VIRGINIA C. DEWEY. Relationship between Pyrimidine and Lipid Biosynthesis and Unconjugated Pteridine.....	280
FELIX BERGMANN, HANNAH BURGER-RACHAMIMOV, AND MEIR TAMARI. Evidence for Different Activation Mechanisms in the Oxidation of 6-Oxo- and 6-Thiopurines by Mammalian Xanthine Oxidase.....	284
R. K. RALPH AND R. E. F. MATTHEWS. Nature of Infectious Material in Deoxyribonucleoprotein Preparations from Leaves Infected with Tobacco Mosaic Virus	287
H. M. NITOWSKY, F. HERZ, AND S. GELLER. Induction of Alkaline Phosphatase in Dispersed Cell Cultures by Changes in Osmolarity.....	293
P. W. HOLLOWAY, RAUL PELUFFO, AND SALIH J. WAKIL. On the Biosynthesis of Dienoic Fatty Acid by Animal Tissues.....	300
G. MANGIAROTTI AND S. PONTREMOLI. Alteration of Enzymatic Activities of Rat Liver Diphosphatase by Treatment with Papain or Urea.....	305
A. CHARI-BITRON. Hydroxylation of Phenylalanine and Tryptophan by Liver Enzyme of Adrenalectomized Rats.....	310
R. C. VALENTINE, WINSTON J. BRILL, AND R. D. SAGERS. Ferredoxin Linked DPN Reduction by Pyruvate in Extracts of <i>Clostridium acidu-urici</i>	315
E. L. HESS AND S. E. LAGG. An Interaction of Deoxycholate with a Microsomal Component	320
SEYMOUR LEDERBERG, BORIS ROTMAN, AND VICTORIA LEDERBERG. Sensitization of Bacterial Ribosomes for <i>in Vitro</i> Amino Acid Incorporation.....	324
H. ROUHANDEH. Facilitation of Infection of Mouse L-Cells with Ribonucleic Acid from Encephalomyocarditis Virus.....	329
RENÉ E. HUMBEL. Isolation of Insulin from the Fish, <i>Lophius piscatorius</i> , by Gel Filtration	333
MYRON L. BENDER AND GERALD E. CLEMENT. Kinetic Evidence for an Acyl-Enzyme Intermediate in the α -Chymotrypsin-Catalyzed Hydrolysis of <i>N</i> -Acetyl-L-Tryptophan Ethyl Ester.....	339

Number 5, August 13, 1963

STEPHEN I. OROSZLAN AND PETER T. MORA. Dissociation and Reconstitution of an Endotoxin	345
JOHN A. THOMA, JUBRAN WAKIM, AND L. STEWART. Comparison of the Active Sites of Alpha and Beta Amylases	350
SASHA ENGLARD AND IRVING LISTOWSKY. The Stereochemistry of the Isocitric Acid Dehydrogenase Reaction	356
ROSS H. HALL. Isolation of 3-Methyluridine and 3-Methylcytidine from Soluble Ribonucleic Acid	361
M. MARTINEZ-CARRION AND W. J. JENKINS. Some Properties of a D-Alanine D-Glutamate Aminotransferase Purified from <i>Bacillus subtilis</i>	365
RALPH A. SLEPECKY. Inhibition of Sporulation and Germination of <i>Bacillus megaterium</i> by Phenethyl Alcohol	369
S. PEDERSEN, A. M. WHITE, AND T. HULTIN. Characteristics of Activation of Ribosomes from Ehrlich Ascites Tumor Cells with Polyuridylic Acid	374
J. CHALOUPKA, P. KRECKOVÁ, AND L. RÍHOVÁ. Repression of Protease in <i>Bacillus megaterium</i> by Single Amino Acid	380
GIOVANNI GIUDICE AND G. DAVID NOVELLI. Effect of Actinomycin D on the Synthesis of DNA Polymerase in Hepatectomized Rats	383
PAUL HOCHSTEIN AND LARS ERNSTER. ADP-Activated Lipid Peroxidation Coupled to the TPNH Oxidase System of Microsomes	388
GEORGE J. SORGER. TPNH-Cytochrome c Reductase and Nitrate Reductase in Mutant and Wild Type Neurospora and Aspergillus	395
A. L. GREENBAUM AND S. E. DICKER. The Swelling of Mitochondria from the Liver and Kidney of a Primitive Rodent (<i>Aplodontia rufus</i>)	402
H. A. ITANO AND A. J. GOTTLIEB. Blocking of Tryptic Cleavage of Arginyl Bonds by the Chemical Modification of the Guanido Group with Benzil	405
D. VAZQUEZ. Antibiotics Which Affect Protein Synthesis: The Uptake of C ¹⁴ -Chloramphenicol by Bacteria	409
P. H. GALE, N. R. TRENNER, B. H. ARISON, A. C. PAGE, JR., AND K. FOLKERS. Coenzyme Q. XLIX. Characterization of Coenzyme Q ₁₀ (H-10) from <i>Penicillium stipitatum</i>	414
JACK L. STROMINGER AND JEAN-MARIE GHUYSEN. On the Linkage between Teichoic Acid and the Glycopeptide in the Cell Wall of <i>Staphylococcus aureus</i>	418
DAVID PERRIN AND JACQUES MONOD. On the Reversibility by Treatment with Urea of the Thermal Inactivation of <i>E. coli</i> β -Galactosidase	425

Number 6, August 16, 1963

ROSS H. HALL. Isolation of 2'-O-Methylribonucleosides from the RNA of Mammalian Tissues and from <i>E. coli</i>	429
HELMUT BEINERT, GRAHAM PALMER, TERENCE CREMONA, AND THOMAS P. SINGER. Correlation of Enzymatic Activity and the Appearance of the EPR Signal at $g = 1.94$ in NADH Dehydrogenase and Its Thermal Breakdown Products	432
AMIRAM RONEN. Pattern in the Appearance of Mutants after DES Treatment among Non-Dividing Bacteria	439
F. J. RYAN AND S. D. CETRULO. Directed Mutation in a Synchronized Bacterial Population	445

GOTTFRIED SCHATZ. The Isolation of Possible Mitochondrial Precursor Structures from Aerobically Grown Baker's Yeast	448
STANLEY ELLIS. A Thiol-Activated Aminopeptidase of the Pituitary	452
CHUAN-TAO YU AND PAUL C. ZAMECNIK. On the Aminoacyl-RNA Synthetase Recognition Sites of Yeast and <i>E. coli</i> Transfer RNA	457
M. J. WOLIN, E. A. WOLIN, AND R. S. WOLFE. ATP-Dependent Formation of Methane from Methylcobalamin by Extracts of <i>Methanobacillus omelianskii</i>	464
NORMAN GOULD, ROBERT C. WONG, AND IRVIN E. LIENER. Inhibition of -SH Enzymes by an Impurity in Commercial Samples of Diisopropylphosphorofluoridate	469
G. E. ADAMS AND D. L. DEWEY. Hydrated Electrons and Radiobiological Sensitisation	473
B. V. RAMASASTRI AND R. L. BLAKLEY. Optical Rotations of the Diastereoisomers of <i>dl</i> , <i>L</i> -Methylenetetrahydrofolate	478
THOMAS S. MATNEY, EUGENE P. GOLDSCHMIDT, AND NANCY S. ERWIN. The Specificity of Genomic Sites Affording Registry with the Fertility Episome in <i>Escherichia coli</i> K12	483
SERGIO ESTRADA O. AND FÉLIX CÓRDOBA. Cortisol Activation of Rat Liver Glutamyl Aspartate Transaminase	487
THOMAS G. PETERSON AND CHARLES R. HEISLER. Purification and Properties of a Soluble Mitochondrial ATPase from Cabbage, <i>Brassica oleracea</i>	492
PIERO CAMMARANO, GIOVANNI GIUDICE, AND G. DAVID NOVELLI. Binding of Amino Acyl-sRNA to Rat Liver Polysomes	498
ISRAEL D. ALGRANATI, HÉCTOR CARMINATTI, AND ENRICO CABIB. The Enzymic Synthesis of Yeast Mannan	504
B. D. SANWAL, M. W. ZINK, AND C. S. STACHOW. Control of DPN-Specific Isocitric Dehydrogenase Activity by Precursor Activation and End Product Inhibition	510
AUTHOR INDEX	516

Provides basic theories, established procedures, and
modern research applications

Introduction to Modern Biochemistry

By **PETER KARLSON**

Institute of Physiological Chemistry, University of Munich, Germany

With a Foreword by **ADOLF BUTENANDT**

Translated from the German by **CHARLES H. DOERING**

April 1963, 434 pp., \$10.00

Introduction to Modern Biochemistry provides a completely integrated guide to the established facts, dominant theories and modern applications of biochemical research. The book is based on Professor Karlson's long teaching experience, and presents a uniquely dynamic approach to biochemistry in that biological significance is stressed.

The work reflects the modern emphasis on turnover and control mechanisms, and thoroughly covers the correlation and application of principles. Special stress is placed on theories that explain the chemical phenomena unique to life.

The work synthesizes the vast knowledge gained in recent years in such fields of research as molecular biology; the chemistry of vitamins and hormones; the constitution and mechanism of action of enzymes; metabolism; and the production, conversion, and utilization of energy. The information is presented in a clear and concise manner, and the most modern viewpoint is employed wherever sufficient evidence substantiates it.

The examples and illustrations are particularly suited for teaching purposes, and the inclusion of a large folding chart of metabolic pathways will also help make this work an invaluable teaching guide.

THE WORK . . .

- presents comprehensive treatment of the entire subject in a manner specifically designed to meet and challenge the abilities of the student
- provides clear, concise, and practical presentation of the basic fundamentals
- includes only the important and understood facts and principles used in modern research, and points out current research interests.



ACADEMIC PRESS

NEW YORK AND LONDON

111 Fifth Avenue, New York 3, N. Y.
Berkeley Square House, London, W.1